IMPERIAL
DEPARTMENT OF AGRICULTURE
FOR THE WEST INDIES.

REPORT

ON THE

BOTANIC STATION,

ST. KITTS-NEVIS.

1912-13.

BARBADOS :
ISSUED BY THE IMPERIAL COMMISSIONER OF AGRICULTURE
FOR THE WEST INDIES.

1913.

[Price Sixpence.]

REPORTS

ON THE

BOTANIC STATION, ECONOMIC PLOTS AND AGRICULTURAL EDUCATION, ST KITTS-NEVIS.

Annual Reports on Certain Economic Experiments conducted in connexion with the Botanic Station, 1900-2.

Annual Reports on the Botanic Station for the years 1901 and 1902.

Annual Reports on the Botanic Station, Economic Experiments and Agricultural Education for the years 1902-12.

SUGAR-CANE EXPERIMENTS.

IN BARBADOS.

Report of the Agricultural Work for 1900:—
Manurial Experiments and Experiments with varieties of Sugar-cane.

Report of the Agricultural Work for the seasons 1899-1901 to 1908-10.
Parts I and II; Manurial Experiments. Part III; Varieties of Sugar-cane.

IN THE LEEWARD ISLANDS.

Report on Experiments conducted with Sugar-canes in the season 1899-1900.

Reports on Experiments conducted with Sugar-canes in the seasons 1900-1 to 1909-10.

Part I; Varieties of Sugar-cane. Part II; Manurial Experiments.

Sugar-cane Experiments in the Leeward Islands, 1911-12.

Parts I and II published together in Royal 8vo.

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LETTER OF TRANSMITTAL.

Commissioner of Agriculture—to His Honour the Administrator, St. Kitts-Nevis.

Barbados,

No. K. 292.

January 20, 1914.

Sir,

I have the honour to forward the Report on the Botanic Station, St. Kitts-Nevis for the year ended March 31, 1913.

2. The unfavourable weather conditions in the early part of the year rendered the maintenance of the good appearance of the Gardens a matter of great difficulty.

3. The section dealing with work in the nurseries shows that a large number of mulberry trees were sent out during the year. The apparent suitability to local conditions of *Aleurites Fordii*, the useful and ornamental wood oil tree of China, is also worthy of note.

4. The plot experiments at La Guèrite have included the usual trials with provision crops, and an important feature of this work has been the large number of cuttings and seeds distributed for planting purposes.

5. In connexion with these experiments, special reference may be made to the general suitability of the variety of ground nut known as Carolina Running, and to the important demonstration with onions, which showed that, even in the face of bad weather conditions, amounts per acre of this produce can be raised worth £37 on the local market.

6. It is to be hoped that an attempt will be made in St. Kitts to extend onion cultivation in connexion with efforts that are being made to establish a West Indian market in Canada for this vegetable.

7. The manurial experiments with pine-apples seem to indicate that proper nitrogenous manuring will pay. The diseased condition of this fruit known as 'black heart', appears to be the so-called 'ripe rot,' which develops only after the fruits have reached maturity.

8. The work done with cotton during the year has been interesting. For the first time for nine years are increases recorded from the application of manures, and it would appear that the soil at La Guèrite is now arriving at a stage at which fertilizers will exert on cotton a beneficial rather than an adverse effect.

9. Selection work with cotton has been continued along the same lines as in former years, and seed has been raised for planting on the estates. The importance of this work cannot be over-estimated.

10. Hybridization work has been continued, and there are indications that the cross, Barbados × St. Eustatius Native F_1 will lead to the establishment of a useful type.

11. Work connected with insect pests and plant diseases has been conducted principally by the scientific officers of this department, in regard to the sugar-cane crop. The results of the work were put before the Agricultural Society and also given publicity in other ways.

12. Progress in the chief industries depends very largely upon climatic conditions. Hence it is not surprising to find the exports of sugar some 2,000 tons below the average. In the case of cotton, too, the dry weather has affected the yield in St. Kitts, but the two circumstances that cotton can be grown as

a catch crop with sugar-cane, and can command, by reason of its great fineness, a high price on the market, have helped to counterbalance the general difficulties experienced by estates during the year under review.

13. In connexion with cotton cultivation, appreciation may be expressed in the matter of the good work which continues to be carried out in Anguilla.

14. The publication under review includes a Report by the Agricultural Inspector, Nevis. Experiments with provision crops continue to be carried on, but the most important work of this nature is the selection of cotton.

15. As in the case of St. Kitts, Nevis, too, has suffered from the effects of dought. The trouble was accentuated, unfortunately, by an exhaustion of the supply of Paris green and the consequent inability to control the later attacks of cotton worm. As Your Honour is aware, provision has been made to prevent a re-occurrence of this circumstance in the future.

16. In both Nevis and St. Kitts the annual agricultural shows proved a great success, a circumstance due largely to the activities of the Agricultural Officers and to the co-operation of the planters.

17. In conclusion I may express my appreciation of the work carried on in St. Kitts-Nevis, and may again point out that the value of this work is not to be expressed merely in simple terms since its beneficial influence is cumulative, and, in several important respects, indirect.

I have, etc.,

(Sgd.) FRANCIS WATTS,

Commissioner of Agriculture
for the West Indies.

REPORT ON THE BOTANIC STATION, ST. KITTS-NEVIS,

For the Year ended March 31, 1913.

CONDITION OF GARDEN, STRIKING SPECIES INTRODUCED, PLANTED OUT, FLOWERED OR FRUITED.

The unfavourable weather conditions of the early part of the year under review made it very difficult to maintain the Gardens to any advantage. In consequence of the long drought many of the old trees died out and constant watering was required to keep the younger plants alive.

During the latter part of the year, with a better rainfall, the general conditions greatly improved ; but owing to the exposed position of the Gardens and the extreme lightness of the soil, it is very difficult to establish imported trees except those of a hardy kind.

The rosery has received much attention and the stock has been renewed with plants imported from Messrs. Good and Reese, Ohio; but from its exposed position this plot drains very rapidly, and during the dry weather it was necessary to keep on a thick mulch of dry leaves to conserve moisture.

An attempt is being made to establish another rosery in a more sheltered spot in the Station, protected by hedges of bread-and-cheese, and, so far, the young plants set out are doing well.

Beds of annuals, zinnias, cosmos, sunflowers, and other ornamental plants were set out after the rains and helped to brighten up the appearance of the Gardens.

The rockeries have been kept up and new plants put where required.

At the suggestion of the Commissioner of Agriculture a small trial plot of coco-nuts was planted on the lawn at the southern end of the Station, where from the exposed position it was difficult to establish ornamental trees. Holes were dug 3 feet deep and filled in with manure to give the young plants a good start. Thirteen well-grown plants were set out in October 1912, and it is proposed, if these are successful, to increase the number later on.

A plot of mulberry trees (*Morus alba*) was planted to get a supply of leaves for feeding silk worms when introduced. These trees were planted at the middle of August and made good progress during the rains. They have now received a considerable set-back from the dry weather and do not seem likely to do well under present conditions.

A hedge of Bougainvillea was planted along the southern side of the nursery to correspond with the one on the western side ; both these hedges have made good growth and are very ornamental and useful.

A plant of *Bougainvillea* sp., from the stock raised by Mrs. Butt, of Trinidad, and kindly given to the Station by Mrs. Fretz, was planted out during the year. It has made good growth and is very ornamental with its dark-purple bracts and flowers.

An attempt was made to substitute a hedge of logwood for the unsightly hedge of Karata growing along the side of the Station near the sea, but it has not so far succeeded owing to the constant drought and sea blast.

The lawn tennis courts are still kept up and used regularly by the members of the Basseterre Lawn Tennis Club.

Among the trees planted out may be mentioned the following: *Thrinax radiata, T. argentea, Cocos plumosa, Manihot Glaziovii, Acacia auriculeformis, Caesalpinia sappan, Blighia sapida, Omphalia triandra, Solanum robustum.*

Many of the large trees in the Gardens, and especially the *Gliricidia maculata*, were attacked by a large borer which did great damage, causing the limbs to break off. One of the Gliricidia trees was so infested with these borers that it was destroyed and burnt. Specimens of the insect were sent to the Head Office in Barbados for examination.

Work in the Nurseries and Distribution of Plants.

DISTRIBUTION OF PLANTS.

The usual assortment of ornamental plants such as palms, ferns, crotons, and roses has been well kept up and command a ready sale to tourists passing through, and to residents.

The total number sold in this way during the year was 332, of the value of £15 7*s.* 8*d.*

There has been very little demand for economic plants such as limes or cacao, as the cultivation of these crops is not being extended, and the attention of the Station is confined chiefly to raising trees suitable for shade or for timber, for which also there is a limited demand.

The total number of plants distributed or sold from the nurseries during the year was 1,090, and consisted of the following :—

Palms of various kinds	62
Mulberry trees (*Morus alba*) ...	552
Gliricidia maculata	19
Aleurites Fordii	2
Ornamental plants	455
Total	1,090

PLANT IMPORTATIONS.

The importation of plants has chiefly been confined to seeds received from the Imperial Commissioner of Agriculture, the Botanic Stations of St. Lucia, Antigua and Trinidad.

Among those that have been received and succeeded may be mentioned the following :—

Received from the Imperial Commissioner of Agriculture: *Aleurites Fordii*; forty plants have been successfully raised and are now being distributed in Nevis and St. Kitts; Mulberry trees (*Morus alba*); a large number of plants raised and distributed to provide food for the silk worm when introduced; *Clavija ornata*, two plants raised; *Diospyros* sp., many plants raised. Received from Trinidad: Six plants *Lecythis zabucajo.* Received from St. Lucia: *Cassia grandis, Combretum laxum, Elaeis guiniensis.* Received from Botanic Gardens Calcutta : two plants *Melocanna bambusioides.*

Plot Experiments at the Botanic and Experiment Stations.

PLOTS AT THE EXPERIMENT STATION AT LA GUERITE.

The plot experiments are carried on entirely at the Experiment Station at La Guèrite and consist of trials with various economic and food-producing crops such as sweet potatoes, yams, ground nuts, cassava, pine-apples, tobacco, Guinea corn, Indian corn, onions, cotton, varieties of sugar-cane, and green dressings.

The smaller experiments are carried on in plots enclosed by a barbed-wire fence and hedges, which are each $\frac{1}{10}$-acre in area and are named by letters from A to O.

The larger experiments with cotton and sugar-cane are conducted on land outside this Station and consist of 6 acres in cotton and 4 acres in sugar-cane varieties.

Cuttings and seeds from these crops when reaped are freely distributed or sold to all persons applying for them. The following list represents the number sent out from the Station in this way during the year :—

Sweet potatoe cuttings	7,100
Cassava „	1,200
Yams sold	300 lb.
Tephrosia candida seeds	1 lb.
Varieties cane plants, cuttings	13,500
Cotton seed, selected, sold	4,270 lb.

Sweet Potatoes (Plot M).

Fifteen varieties of sweet potatoes were planted in this plot on June 21, 1912, and reaped on January 14, 1913.

The cuttings were planted 2 feet apart on banks 3 feet wide. A crop of ground nuts had been previously reaped from this plot, the vines being buried in, but no manure was applied otherwise.

The following table gives the results of this experiment, the average of past experiments and the general characters of the roots :—

Variety.	Yield per acre in lb.	Average yield under experiment.	Characters.	Cooking qualities.
Caroline Lee ...	13,200	15,504 (10 expts.)	Dull, red, large	White, good
Spooner ...	10,340	15,021 („ „)	White, medium	„
White Gilkes ...	6,600	14,683 („ „)	White, large	„
Red Bourdon ...	19,140	13,861 („ „)	Red, large	White, dry
Blue Belle ...	15,840	12,885 („ „)	White, medium	„
Hug-me-tight ...	22,000	12,228 (13 expts.)	Light red, large	Yellow, fairly
Mother Kitty ...	6,270	11,677 („ „)	„	dry.
Bobby ...	13,860	11,520 („ „)	White, medium	White, firm dry
Playwell ...	6,105	10,190 („ „)	„	White, good
Brass Cannon ...	15,510	9,550 (2expts.)		White, floury
Red Hen and Chickens	14,630	9,370 (13 expts.)	Red, medium	Creamy, soft
Montserrat Emma	16,500	9,082 (10 „)	White, medium	White, firm
T. 1	8,250	5,614 (8 „)	White, small	White, good
T. 2	5,940	4,804 (8 „)	„ „	„ „
Harriss	5,280	4,620 (2 „)		

Yams (Plot J).

An application of farmyard manure at the rate of 250 barrels per acre was given this plot and the banks made up 4 feet wide. Ten varieties of yams were planted on June 10, 1912, the cuttings being first passed through Bordeaux mixture.

For the first three months these yams had a hard time owing to the dry weather, from which they never quite recovered when the rains set in.

They were reaped on February 10, 1913; the returns were very disappointing in weight, and the size of the yam was small. The general yield of the yam crop throughout the whole island was also very disappointing, which points to the fact of bad weather conditions.

The following table gives results of this experiment and the average for the past nine years:—

Variety.	Yield per acre in lb.	Average yield for nine years.
Light Red	9,000	14,672
Seal Top	9,440	13,036
Horn	4,180	10,662
Crop	5,420	11,438
Bugle Horn	4,000	9,748
Lisbon	6,500	9,652
Bottle Neck Lisbon ...	10,000	8,844
Oriental	3,500	6,202
Cush Cush	2,750	7,230
Danish	3,300	6,082

Cassava (Plot L).

A crop of yams was reaped from this plot; the land was then rebanked and on February 19, 1912, cuttings of ten varieties of cassava were planted on the banks 2 feet apart. The cuttings were first treated with Bordeaux mixture.

For the first seven months the plants suffered very much from the drought and did not make strong growth. In the latter part of the year very wet weather came on, causing some of the roots to rot before being reaped. One of the varieties (Bitter No. 1) gave no return, and some of the others were very low.

The following table gives results of the experiment and average yield for nine years :—

Variety.	Yield per acre in lb.	Average yield for nine years.
1. French No. 3	4,000	11,827
2. Jackroe	2,500	11,264
3. Bitter No. 1	—	7,970
4. Small Leaf	8,330	11,504
5. Blue Top	10,250	11,690
6. Red Greenaway ...	8,750	11,646
7. Bitter No. 4	6,250	9,560
8. White Greenaway ...	8,750	9,875
9. Black Stick	3,750	9,836 (7 expts.)
10. Sweet No. 1	3,750	5,417

Ground Nuts (Plot B).

Three varieties of ground nuts,—the Carolina Running, Spanish and local—were planted in this plot each variety being $\frac{1}{30}$-acre in area. One half of the area of each variety was limed at the rate of 1,000 lb. per acre.

The Carolina Running and the local were set out on the flat at 18 inches apart; the Spanish were set in shallow furrows 12 inches by 15 inches. All the seed nuts were passed through Bordeaux mixture before planting.

Again this season, most unfavourable weather conditions attended this crop. They were planted at the end of June, there being no rain to plant earlier. The Spanish, which should have matured in four months, were so affected by the drought in the early stages of growth that they only gave the small return of 37 lb. to the plot, or at the rate of 1,100 lb. per acre.

The local nuts suffered also from their position in the plot, being affected by the shade of the trees growing along the experiment station. These only gave a return of 20 lb. to the plot, or at the rate of 600 lb. per acre.

The Carolina Running was much more satisfactory and gave a yield of 100 lb. to the plot, or at the rate of 3,000 lb. uncured nuts per acre. This would mean an average of about 20 barrels of cured nuts per acre. This variety seems hardy and well suited to local conditions.

The ground nut crop, as a whole, was bad this season all about the island, the weather being very much against their growth at the right time.

A small quantity of seed of the 'Rufis-que' variety of ground nut, received from the Imperial Institute through the Department of Agriculture, was planted out to secure seed for next season. A fair return of good sound nuts was obtained and a larger area has again been planted for the coming season.

Onions (Plot F).

A crop of tobacco was reaped from this plot early in the year. Velvet beans were then sown and a heavy crop turned under as green dressing in October 1912. An application of pen manure at the rate of about 10 tons per acre was put on and the land carefully prepared and laid out in beds for onions.

The seed, which was imported from Teneriffe through the Imperial Department of Agriculture, was sown in nursery beds in September and on October 29 they were transplanted out into the plot at distances apart of 9 inches by 4 inches.

These plants grew well and no trouble was experienced from worms or other pests.

The onions were reaped in February 1913 and gave a return of 1,000 lb. uncured onions. Owing to the weather being very wet at time of reaping these onions were rather soft and difficult to cure, so some loss was experienced from rotting in the centres.

Six hundred pounds of cured onions were sold in the local market, realizing £3 14s., or at the rate of £37 per acre.

Tobacco (Plots I and K).

Both these plots had a heavy dressing of velvet beans turned under early in November, and the land was carefully prepared in 8-feet banks for tobacco, the furrows being well forked for the reception of the young plants.

Fresh seed was specially imported from Messrs. P. Henderson & Co., New York, it being found that the seed saved from last season was not reliable. In consequence of this, the young plants were put out later than usual, on December 5, instead of in October as has been the custom. The plants grew well, but being small, an application of artificial manure was given them at the rate of 150 lb. nitrate of soda and 100 lb. sulphate of potash per acre, but this did not make much improvement and the seed buds began to form when quite small, owing doubtless to lateness of planting.

Half of plot K was planted in Havana and half in Sumatra, and the whole of Plot I was planted in Virginia tobacco, but the return was so small that it was not thought advisable to keep the varieties separate as it would all be sold locally.

Pine-apples (Plot O).

This experiment is a continuation of the experiments with pine-apples reported on in the Annual Reports of 1910-11 and 1911-12, which were laid out with the view of ascertaining if the disease known as 'black heart' could be controlled by good cultural methods, and also to carry on manurial experiments, and experiments in planting in rows and beds at different distances apart.

In the experiment of 1911-12 it was determined that the disease was not controlled by either good cultural methods, or by the manurial treatment received, as all the fruits were liable to infection. This was confined almost entirely to those planted in the row system as those planted on the flat, in beds, had not come into bearing at the time.

One half of this plot is planted on banks 3 feet wide, suckers 15 inches apart and the other half flat in beds, suckers 15 inches square. As a result of last season's experience it was found that planting on rows had the drawback of the plants giving way under the weight of the fruit, having nothing near to support them; while planting 15 inches square on the beds was too close, it being impossible to handle the plants; and it was determined in future experiments to plant flat on beds, in three rows, 18 inches square, allowing a sufficient space between the beds for weeding and the picking of the fruit.

The manurial experiments reported on in the last annual report were again carried on but were only applied in two doses instead of four, one being given in September 1912 when the plants in the rows had ceased bearing, and the other when they began to blossom about May.

These manurial experiments were conducted separately in each half of the plot and are as follows:—

No. 1 No manure
No. 2 Pen manure
No. 3 10 lb. nitrogen as tankage per 1,000 plants in four doses
No. 4 20 ,, potash as sulphate
No. 5 8 ,, phosphoric acid
No 6 10 ,, nitrogen as tankage, 20 lb. potash and 8 lb. phosphoric acid in four doses per 1,000 plants.

These manures were applied by sprinkling over the crown of the plants.

Early in May 1912, the plants both in beds and in rows began to bear, and at end of June the first ripe pines were picked.

In August a package of pine-apples was sent to the Commissioner of Agriculture for examination for 'black heart' disease and the Mycologist reported 'that the pines arrived in good condition with no outward signs of disease but the majority showed the brown discoloration characteristic of black heart extending inwards from certain of the eyes when the fruits were cut up. Black heart appears to be of the nature of a ripe rot developing only after the fruits have reached maturity.'

The majority of the pine-apples picked and sold during the season showed no signs of the disease, nor were any complaints made by purchasers. It was only in very ripe fruit that the disease was apparent.

A careful record was kept of the number and weight of the fruit picked both from rows and beds, and the following table gives the results and average weights:—

Plot.	Number of fruit.	Weight, lb.	Average weight.	Number of fruit.	Weight, lb.	Average weight.
	Planted	in beds.		Planted	in rows.	
No. 1	50	112	2·2	56	147	2·6
No. 2	90	238	2·6	34	102	3·0
No. 3	99	290	3·0	32	96	3·0
No. 4	77	184	2·4	25	73	2·9
No. 5	86	193	2·2	56	163	2·9
No. 6	65	195	3·0	34	98	2·9
Totals	467	1,212	2·6	237	679	2·9

The following table shows the percentage of plants that bore fruit, planted in the beds, and in the rows; it must however be remembered that those in the beds were from first bearing plants and those in the rows from ratoon suckers:—

Plot.	Planted in beds. Percentage of fruit.	Planted in rows. Percentage of fruit.
No. 1	36·8 per cent.	82·2 per cent.
No. 2	66 „ „	50 „ „
No. 3	72·8 „ „	48 „ „
No. 4	56·6 „ „	37 „ „
No. 5	63·2 „ „	82·2 „ „
No. 6	48 „ „	34 „ „

Thornton's Hybrid Cotton (Plot A).

This is a continuation of the experiment reported on in the Annual Report, 1912-12, where 100 holes of cotton known as Thornton's Hybrid, received from Mr. Thomas Thornton of Tobago, were planted with the object of producing a stable variety.

As was stated in that report, the lint was of good length possessing good qualities, and 100 seeds from bolls that had been bagged were saved for future planting.

These 100 seeds were planted in Plot A on July 5, 1912, and were known as Thornton's Hybrid F.

These trees grew most luxuriantly and bolled very heavily. The seed-cotton from each tree was picked separately and kept in bags labelled according to number on tree, in order that the lint may be examined for future planting.

The majority of the trees, however, did not prove true to type, and after very careful selection both for yield per tree and qualities of lint it was only found possible to select one tree, No. 47, which gave a yield of 1 lb. of seed-cotton with lint of 50 mm. and was strong and fine.

Five hundred seeds from this selected tree have been planted in the field at La Guèrite for further trial on a larger scale.

Mulberry Tree (*Morus Alba*) (Plot D).

Half of this plot was planted in mulberry trees for the purpose of raising food for silk worms, the culture of which it was proposed to introduce in the island. These trees were carefully planted and much attention given them through the dry weather, consequently they have grown well as compared with those planted outside the Station, which could not be watered. The tree seems difficult to establish, except under favourable circumstances of soil and rainfall.

Green Dressings.

Green dressings of velvet beans have grown on all vacant plots and have yielded heavy crops, which have been turned in as manure. As the supply of pen manure is limited this forms a valuable addition and keeps the soil in good condition.

Hedges.

The hedges of bread-and-cheese (*Pithecolobium Unguis-cati*) and white cedar growing around the experiment station have all been kept well-trimmed and in good order. They now form a protection not only against the trespassing of small stock, but also act as an efficient wind-break. As the roots of these hedges were damaging the crops in the plots near them, it was found necessary during the year to dig a deep trench to cut back these roots.

COTTON.

Manurial and Other Experiments.

Manurial and other experiments with cotton have again been carried on in connexion with the work of the Experiment Station at La Guèrite and form a continuation of the eight previous years' experiments. (See Reports Botanic and Experiment Stations, St. Kitts-Nevis, for 1904-5, 1905-6, 1906-7, 1907-8, 1908-9 1909-10, 1910-11, 1911-12 cotton manurial and other experiments.)

The manurial experiments on plots of $\frac{1}{40}$-acre in area in duplicate extending over an area of 2 acres have now been carried on for nine years on exactly similar lines, and on the identical plots, in accordance with the manurial scheme published in the *Agricultural News*, Vol. III, p. 237. Full reports of previous experiments have been published in the *West Indian Bulletin* (Vol. VI, p. 247 ; Vol. VII, p. 283 ; Vol. X, p. 269 ; Vol. XI, p. 60, and Vol. XII, p. 1.)

These experiments consist of thirty plots in duplicate known as series No. I and No II. In former experiments these were planted in different months, but as the advisability of early planting was clearly proved, the planting in the last two years has been done in June.

A good stand of young cotton was secured, and the manures were applied early in July, but owing to the very dry weather experienced in the next two months the plants did not grow much and began to flower when quite small.

The rains in September considerably improved the condition of the trees, but from their early blooming, the cotton began to ripen up earlier than usual and first picking commenced on October 5 in both series, continuing until November 12. On December 3, the new bolls, after the rains, began to ripen up, and picking continued from that date until the end of January 1913.

In consequence of the rains in the latter part of the year the yield from these plots was considerably more than was at first expected, and at the end of the season the good yield of 1,184 lb. of seed-cotton per acre was obtained.

Tables are attached giving lists of manurial experiments, the results of each plot for the season under review, and the average results for each plot for the nine years that the experiments have been carried on.

RESULTS OF COTTON MANURIAL EXPERIMENTS CARRIED ON AT LA GUERITE, ST. KITTS, AND YIELD OF SEED-COTTON IN POUNDS FOR SEASON 1912-13.

No. of Expt.	Nitrogen as nitrate of soda.	Nitrogen as sulphate of ammonia.	Potash as sulphate of potash.	Phosphoric acid as basic phosphate.	Cotton seed meal.	1911-12. Series I.	1911-12. Series II.	Means.	Difference on No manure.
1	No manure					1,090	995	1,042	
2	Pen manure					1,320	970	1,145	+103
3			30	40		1,165	1,210	1,187	+145
4		20	30	40		1,090	1,145	1,118	+ 76
5		30	30	40		1,215	995	1,105	+ 63
6	20		30	40		1,225	1,280	1,252	+210
7	30		30	40		1,130	920	1,025	- 17
8		30	30			1,175	740	958	- 84
9		20				1,275	1,120	1,198	+156
10		30				1,070	1,095	1,082	+ 40
11	20					1,420	1,100	1 260	+218
12	30					1,485	760	1,122	+ 80
Phosphat eseries									
13		30	30			1,175	740	958	- 84
14		30	30	40		1,215	995	1,105	+ 63
15		30	30	60		1,200	1,005	1,102	+ 60
16		30	30	80		1,215	1,040	1,128	+ 86
17				40		1,140	1,135	1,138	+ 96
18		30	30	40		1,470	965	1,218	+176
19		30	30	60		1,410	930	1,170	+128
Potash series									
20		30		40		1,155	1,140	1,148	+106
21		30	20	40		1,180	1,250	1,215	+173
22		30	30	40		1,215	995	1,105	+ 63
23		30	40	40		1,475	1,200	1,338	+296
24			40			1 270	1,105	1,188	+146
Cotton seed meal									
25					300	1,380	1,290	1,335	+293
26					600	1,230	1,410	1,320	+278
27			30		300	1,070	1,055	1,062	+ 20
28				40	300	1,310	1,280	1,295	+253
29			30	40	300	1,530	1,385	1,458	+416
30		30	30	40	600	1,505	1,230	1,368	+326

RESULT OF COTTON MANURIAL EXPERIMENTS AT LA GUERITE, ST. KITTS, SERIES No. I and II, OVER A PERIOD OF NINE YEARS.

No. of Expt.	Nitrogen as nitrate of soda.	Nitrogen as sulphate of ammonia.	Potash as sulphate of potash.	Phosphoric acid as basic phosphate.	Cotton seed meal.	Average for nine years.	Difference on No manure.
1	No manure					1,273	
2	Pen manure					1,312	+ 69
3			30	40		1,252	- 21
4		20	30	40		1,335	+ 62
5		30	30	40		1,260	- 13
6	20		30	40		1,388	+115
7	30	30	40	40		1,212	- 61
8		30	30	60		1,312	+ 39
9		20				1,153	-120
10		30				1,285	+ 12
11	20					1,387	+114
12	30					1,322	+ 49
Phosphate series.							
13		30	30			1,312	+ 39
14		30	30	40		1,260	- 13
15		30	30	60		1,303	+ 30
16		30	30	80		1,338	+ 65
17						1,266	- 7
18		30	30	40		1,308	+ 35
19		30	30	60		1,248	- 25
Potash series.							
20		30	20	40		1,203	- 70
21		30	30	40		1,193	- 80
22		30	30	40		1,260	- 13
24			40			1,254	- 19
Cotton seed meal							
25					300	1,342	+ 69
26					600	1,378	+105
27			30		300	1,327	+ 54
28				40	300	1,362	+ 89
29			30	40	300	1,374	+101
30			30	40	600	1,353	+ 80

Plant No	Height of plant.	No. of bolls on plant.	Weight of seed-cotton to plant, grms.	Percentage of lint to seed.	Percentage of weak fibre.	Strength of fibre.	Strength of fibre in mm.	Regularity of length.	Lustre.	Fineness.
416	3½ ft.	90	169·8	30·0	13·0	Strong	44·3	Regular	Lustrous	Fine
420	„	250	707·5	24·1	13·8	Strong	49·8	Very regular	Lustrous	Very fine
325 C	„	170	339·6	25·0	11·8	Strong	48·6	Fairly regular	Lustrous	Fine
342 A	„	100	283·0	23·5	12·1	Strong	50·6	Very regular	Lustrous	Fine
205	„	180	509·4	23·5	12·6	Strong	51·2	Very regular	Lustrous	Fine
206	„	120	339·6	28·5	13·9	Strong	44·8	Regular	Fairly lustrous	Fine
208	„	80	198·1	25·0	12 5	Very strong	46·8	Regular	Lustrous	Fine
217	„	190	509·4	23·5	11·4	Strong	49·3	Very regular	Lustrous	Fine
220	„	80	212·3	30·0	15·1	Strong	47·9	Fairly regular	Lustrous	Fine
467 St. V.	„	160	424·5	25·9	13·6	Strong	48·7	Regular	Lustrous	Fine
470 St. V.	„	180	495·2	28·1	12·7	Very strong	47·7	Fairly regular	Lustrous	Fine

From these tables it will be seen, from the results extending over the nine years, that the average return of the unmanured plot No. 1 was 1,273 lb. of seed-cotton per acre, while the average of the total plots under experiment was 1,297 lb. per acre, or practically the same; and taking the same test as in the last Annual Report, we find that in no instance has there been in any one plot an increase of 10 per cent. on the unmanured plot.

Taking, however, the results of the past season, we find that the unmanured plots in the two series yielded an average of 1,042 lb. of seed-cotton per acre, while the average of all the plots was 1,183 lb. of seed-cotton per acre—an increase of 13 per cent. in favour of the manured plots. In only one instance, that of plot No. 8, was there a decrease and that of only 8 per cent. In some of the plots, notably those of the cotton seed meal series, there were considerable increases, one of them, No. 29, giving an increase of 49 per cent. over the unmanured plot.

From these results taken over a period of nine years the experience of past years has been borne out, that the addition of artificial manures under the conditions existing at La Guérite has not been attended with remunerative results.

Taking, however, the results of the past season alone, it appears as if the action of the manures is evident in the striking increase of many of the manured plots, and these experiments which are being continued on similar lines will soon afford very instructive and interesting records of the action of these manures which are only now, after a period of nine years, beginning to show any very marked increase over that of the unmanured plots.

Two acres of land that had been in ratoon canes was planted the first week in June with cotton seed from these selected trees, No. 205, 325, and 420, the seed from each individual tree being used to plant an area of ⅔-acre.

The land was made up into 5-feet banks, the trash being well buried under, cross-holes dug 4¼ feet apart and the cotton planted two plants on each centre or cross-hole.

The seed grew well, and as was stated in the Annual Report of 1911-12, in spite of all the dry weather experienced in the early stages, this cotton produced sturdy vigorous trees, while the cotton planted at the same time in land that had been continuously in cotton for nine years was struggling for existence. This was a striking proof of the great benefit of a good supply of vegetable matter in the soil to enable the plants to resist the drought.

The first picking from this cotton began on October 5, and it was all reaped and canes planted in the same land early in January 1913—a period of about seven months.

The yield from the 2 acres was 2,288 lb. of seed-cotton, or at the rate of 1,122 lb. seed-cotton per acre, of which,

No. 420 gave at the rate of	1,293 lb.	per acre
No. 205 „ „	1,078 „	„
No. 325 „ „	1,060 „	„

As in previous years, an area of 1¼ acres was planted in seed from the individual selected plants that have been under careful selection at La Guérite for the past five years, for the purpose of raising seed of the best local type for sale in the island. This land has been continuously in cotton for the past nine years, and has had no manure of any kind with the exception of an application of 800 lb. cotton seed meal per acre given last season.

The total amount of seed-cotton picked from this 1¼ acres was 1,131 lb. and comprised the following selected trees:—

No. 206 at the rate of	1,075 lb.	seed-cotton	per acre
No. 208 „ „	945 „	„	„
No. 217 „ „	702 „	„	„
No. 219 „ „	600 „	„	„
No. 220 „ „	600 „	„	„
No. 342 „ „	1,110 „	„	„
No. 467 „ „	640 „	„	„
No. 470 „ „	847 „	„	„

The cotton from these trees was all ginned separately, and the seed saved for sale for planting on estates.

Hybrid Cotton.

Seeds from the cross between the St. Kitts Sea Island cotton and St. Eustatius, and the Barbados (Sterling) Sea Island and St. Eustatius F. 3. from bolls that had been bagged to prevent cross-fertilization as was stated in the Annual Report of the Botanic Station for 1911-12, were planted out in the field at La Guérite for more extensive trial.

The St. Kitts × St. Eustatius was planted in seventeen rows with a total of 463 trees; and the Barbados (Sterling) × St. Eustatius, was planted in twenty-five rows with a total of 928 trees.

These trees grew to a large size, their habits very much resembling the St. Eustatius native.

As soon as the first bolls began to ripen, each tree was carefully examined in the field for quality of lint produced, and if the length and fineness was up to a certain standard the tree was labelled with a number, and a corresponding number put on a bag into which all the cotton picked from that tree was kept for more extensive examination.

A large number of trees was selected in this way and the cotton from the rest of the plot was ginned and shipped to the British Cotton Growing Association in a small bale of 129 lb. of lint. No report of the sale of this has yet been received.

The seed-cotton from the selected trees was then subjected to a rough examination for weight of seed-cotton per tree and quality of lint. Any sample

that gave less than 12 oz. seed-cotton was at once rejected. On the final examination, none of the samples of the St. Kitts × St. Eustatius native was found to possess the characteristics sought for, such as weight of seed-cotton combined with length, strength, and fineness of lint, and for this reason all these were rejected.

From the sample of the Barbados (Sterling) × St. Eustatius native two samples, No. 33 and 100, were selected, each of which gave 1 lb. of seed-cotton per tree with lint of good length, averaging 45 mm., strong and fine.

The seed, from these samples was very carefully selected and 500 holes of seed from each tree have been planted in the field at La Guérite, and labelled Barbados × St. Eustatius Native F 4.

As this is now the fourth generation, it is hoped that by mass selection in the field it will be possible to secure a stable cotton possessing the characteristics sought for.

The total yield of the cotton from the manurial and other experiments at La Guérite, comprising 6½ acres, of which ¾-acre was in hybrid cotton, was 1,370 lb. first quality lint, 129 lb. lint from stained cotton, and 122 lb. hybrid lint—a total of 1,621 lb.

Routine Selection Work.

Cotton selection work carried on on similar lines as that reported on in the Annual Reports Botanic and Experiment Stations, St. Kitts-Nevis, 1907-8, 1908-9 1909-10, 1910-11, 1911-12, has been conducted during the season under review.

Seeds from the individual trees that were referred to in last year's report in Tables A. 5, B. 4, C. 3 and D. 2, under the Nos. 416, 420, 325, 342 (S), 205, 206, 217, 219, 220, 467 (V) and 470 (V), and which have been now under selection for many years, were again planted out in the experiment plots at La Guérite.

Three seeds were selected from each tree with lint of the greatest length, and possessing best characteristics of strength, regularity, and fineness. These thirty-three seeds were planted in a nursery at La Guérite and the cotton from each tree was kept in a separate labelled bag and subjected to very careful examination according to the method suggested by Mr. H. A. Tempany, Superintendent of Agriculture for the Leeward Islands, for selecting cotton in the Leeward Islands.

As an example of the care needed in this selection work it was found that all the seeds from the cotton from No. 219 tree were quite black, with no fuzz attached to the end, and the lint itself was not up to standard.

These individual trees gave very large yields of cotton as will be seen from the table attached, and the quality of the lint as regards length, strength, regularity and fineness, showed that the good characters for which these trees had been originally selected, had been transmitted and in some instances intensified.

Seeds from Nos. 205, 217, 325, and 420, which each gave over 1lb. of seed-cotton, have been set aside for planting in a field of 2 acres now in ratoon canes, and the seeds from the remaining trees will be used in planting the manurial and other experiments for the coming season, which will insure a large supply of best selected seed to be reserved for sale to the estates in the island.

As was stated in last year's report, the practical result of this work is most encouraging, the demand for the selected seed being very great and the results from it being such as to warrant growers planting their entire crop with it.

This seed is sold locally at 2½*d.* per lb. selected, the total amount sold during last season being 4,200 lb.

NOTES ON ECONOMIC PLANTS.

Onions.

Thirty pounds of white and 15 lb. of red Bermuda onion seed were imported through the Imperial Department of Agriculture from Teneriffe and sold to growers in the Presidency at cost and charges.

Only a very few private individuals engage in this industry, which is entirely confined at the present time to supplying the local market, no attempt having been made to plant on commercial lines. There is no question of this being very remunerative, but the attention of the planters is taken up with cane and cotton for which they find a more ready market.

Cacao.

No increase is to be reported in the cultivation of cacao. At Molineux estate where it is cultivated on proper lines the area has not been extended beyond the 30 acres mentioned in last year's report, the idea being to judge from the success of this experiment before putting in a larger area.

The older trees are bearing well, and the general condition of the plants is very promising. There is a tendency in some spots for trees to wither up suddenly and die off, and this trouble was referred to by the Mycologist of the Department in his report on his last visit to St. Kitts. It has not been quite settled if it is due to insect or root trouble.

Work Connected with Insect and Fungus Pests and Their Control.

SUGAR-CANE.

During the past season owing to the drought in the earlier months of the year the canes, particularly in the district around Basseterre suffered very much from attacks of moth borer and root disease (*Marasmius sacchari*). The Entomologist of the Imperial Department of Agriculture spent some months in the island investigating the insect pests of cane, and an interesting and instructive report was written by him, which was read before the Agricultural and Commercial Society for the information of planters.

Specimens of a root borer similar in appearance to the root borer of Barbados (*Diaprepes abbreviatus*) were found, also a large number of weevils below the surface feeding on the castor plants growing around the cane fields. These Mr. Ballou associated with the root borers, and it was the first instance in which he was able to make any suggestion as to the larvae of these weevils or their feeding habits. This insect is known in the publications of the Department as *Epicaerus ravidus.**

Another insect found in large numbers in the cane fields was a small brown hard back, the larvae, pupae and adult all being abundant. This insect was named through Mr. Marshall by Arrow, who states that it is *Lachnosterna patruelis.*

Mr. Ballou says: 'The occurrence of these grubs in considerable numbers in the sugar-cane fields in St. Kitts is of interest, especially in view of the fact that related insects are attracting attention as serious pests in other parts of the world.'

TERMITES. These occupied much of Mr. Ballou's time and attention and are confined to certain cane fields on Pond estate. As is stated in his report: 'Termite attacks on growing cane generally begins above the ground; they apparently often enter by means of a borer hole and begin the attack about the time that the lowest internodes begin to ripen. The roots of the canes also are often eaten out and the cavity thus made is lined by the insects with their peculiar cement-like substance, and a tunnel is thus formed. The galleries and tunnels of these

*Since identified as *Exophthalmus esuriens.* -- Ed.

insects have been found in the soil to a depth of some 14 to 18 inches. This occurrence of termites attacking growing and ripening canes is the only case known to me'

The remedies suggested were planting cotton for some years as a rotation crop, and in all cases the use of carefully selected cane plants free from any termite attack. The digging out and removing of the old cane stumps was strongly advised as a means whereby the attacks of moth borer and root diseases could be combated.

RIND DISEASE. This was present to a considerable extent during the reaping season at Cranstouns estate in the northern part of the island, and the Mycologist of the Department, Mr. F. W. South, paid a special visit to investigate this.

In his valuable report read before the Agricultural and Commercial Society, Mr. South described the symptoms of this well-known disease and attributed the outbreak to the over-ripe condition of the canes and the presence of large numbers of moth borers owing to the very dry weather experienced.

The remedies advised in case the disease increased were:—

(1) The destruction of all rotten canes left in the fields or in the yard.
(2) The burning as fuel of the megass of such diseased canes as are crushed.
(3) Rotation of crops using cotton and green dressings.
(4) Substitution of new tested resistant varieties of seedling canes for those now in circulation.
(5) A systematic rotation of cane varieties.

COTTON.

Severe attacks of caterpillars (*Alabama argillacea*) occurred during the cotton season and large amounts of poison were used to destroy them. Little damage was done to the plants.

Leaf-blister mite as usual appeared when the cotton was maturing, but as the greater part of the cotton planted is turned in at once after the first bearing, there is little danger of this pest causing any serious loss. In some instances where the cotton is planted as a permanent crop the old trees have been kept to the detriment of their neighbours, but this I am glad to state is only in very exceptional cases.

Cotton stainers were fairly abundant about February and March but as most of the cotton is reaped by then little damage was done.

Disinfection of Plants.

In accordance with the provisions of the Plant Protection Ordinance, forty-four parcels of seeds and thirty plants were received at the Botanic Station for fumigation or disinfection at the discretion of the Officer-in-Charge.

The materials used for treatment of these plants and seeds where necessary are hydrocyanic acid gas, carbon bisulphide, corrosive sublimate, and Bordeaux mixture.

Progress in the Chief Industries.

THE SUGAR INDUSTRY.

The very dry weather experienced in the first eight months of 1912 resulted in very poor returns being obtained from the sugar crop, especially on those estates in the Basseterre district from which the Central Factory received their supply.

For the year 1912 the crop shipped amounted to 10,554 tons, of which 4,086 tons were of 96° grey crystal sugar and 6,468 tons muscovado. The following table gives a summary of the amount of sugar exported annually from St. Kitts-Nevis since the year 1906, which shows how much below the average this year's output has been :—

Year.	Tons.
1906	15,191
1907	14,178
1908	11,044
1909	12,027
1910	12,510
1911	11,456
1912	10,554

For the season 1912-13 the prospects are much better, and owing to the good rains of the latter part of 1912 and the early part of 1913 there is every reason to expect that the sugar crop for the coming year will again reach the average.

By a return kindly supplied by the estates, it is shown that out of the 7,300 acres under canes to be reaped in St. Kitts, 72 per cent. is planted in the newer varieties, the remaining 28 per cent. being in White Transparent.

B. 147 still maintains its well deserved popularity as a cane suitable for almost every district, while among the newer varieties, B. 1753 has increased in acreage. This cane under favourable circumstances gives large returns both in plants and ratoons, but owing to its hard rind is not easily crushed in the small muscovado mills.

The sugar-cane experiments continue as usual to form an important part of the work of the Agricultural Superintendent, who is responsible for the laying out and conduct of these experiments under the direction of the Superintendent of Agriculture for the Leeward Islands.

The experiments with selected varieties of sugar-cane are conducted at two central stations, one at La Guérite and one at Molineux estate, and at six out-stations in St. Kitts : Brighton, Brothersons, Estridges, West Farm, Buckleys, and Douglas ; and at Pinneys estate in Nevis.

At the two central stations all new varieties of cane are grown and tried before being sent out to the smaller stations, and during the last season ninety-two varieties were grown in this way at La Guérite and forty at Molineux.

At the six smaller stations, fifteen selected varieties are grown as plants and ratoons and cultivated under the same conditions as the average canes on the estate. In this way, the planter is able to distinguish for himself the variety of cane that is most suitable for the conditions of the district in which he lives, and is also in a position to increase the area of any particular variety.

In addition to these experiments with varieties of canes, thirty-five experiments with manures have been conducted on ratoon canes, including experiments with the new nitrogenous manures, calcium cyanamide and nitrate of lime.

Samples of cane from each plot of the varieties have been crushed in the experimental mill attached to the Laboratory and the juice analysed by the Federal Assistant Chemist, Mr. V. Weil.

The results of these experiments are reported on annually in a separate report prepared by the Government Chemist and Superintendent of Agriculture for the Leeward Islands, and copies of the individual results are forwarded to each planter on whose estate the experiments were carried on.

The main features of the experiments are also brought before a meeting of the Agricultural and Commercial Society for the information of members.

As was the case in the year 1911, the rainfall during the year under review has shown a marked difference in the several districts of the island. In the northern districts the rainfall was very good, averaging from 60 to 70 inches, while in the valley or Basseterre district it averaged only from 40 inches, with a corresponding difference in the return of sugar per acre.

THE COTTON INDUSTRY.

The area planted in cotton in the Presidency during the last season was about 5,500 acres—an increase of about 900 acres on the previous year's planting.

The estimated area planted in each island was as follows :—

St. Kitts	2,000	acres
Nevis	2,500	„
Anguilla	1,000	„ (estimated)
Total	5,500	acres

In St. Kitts the area planted was 2,000 acres—an increase of about 500 acres on the previous year. Of this, 1,350 acres were planted as an intermediate crop with cane, and 600 as a permanent crop.

This practice of planting cotton as an intermediate crop with cane has now been almost universally adopted where the climatic conditions are such as to permit it.

The cotton is planted by the estates on the lands from which the ratoon canes have been reaped, and every effort is made to get the cotton in with the first rains so as to get the first picking off, and the trees turned in, in time for planting the crop of canes for next season. In the different districts the time for planting varies, as it is found more suitable in the northern district to plant very early, in March or April, so as to get the cotton matured before the rainy and cooler weather comes on in October and November. In the valley and southern districts May and June planting is found more suitable as the rains seldom allow any chance of planting earlier.

As has been stated in previous reports, this practice is very remunerative, and it is found by practical results extending over many years that the following cane crop is in no way affected by the crop of cotton taken from the land—in fact it is claimed that from the good cultivation and constant tillage of the cotton plants the resulting returns from the canes planted after cotton are always above the average.

Owing to the very unfavourable weather experienced in the early stages of growth, the yield of cotton lint per acre was not so generally good as in previous years. There have been individual instances of very large returns such as 320 lb. of lint per acre over an area of 25 acres and 300 lb. lint per acre over 60 acres ; but these were exceptional cases, and as far as can be estimated the average return per acre has been only 150 lb. of lint, the total output of the season being about 302,664 lb. of lint up to June 30, 1913.

On two estates in the northern district, owing to the probable low price of sugar, it was decided to plant in cotton 40 acres of land that had been prepared and manured for canes—in fact the canes had been already planted. The cotton was planted in February, and from the general condition of the trees and heavy bolling there seems little doubt but that the experiment will prove a financial success.

Notes in connexion with insects, etc., affecting this crop will be found under the heading Work in Connexion with Insect and Fungus Pests, etc, earlier in this report.

The same ginneries have been at work during the past season—the large ginnery at Spooners with oil plant attached, which gins almost the entire crop of the island, and the smaller ginnery at Stone Fort estate with oil engine and hydraulic baling press.

The cotton shipped early in the season has all sold readily at prices ranging from 1*s.* 6*d.* to 1*s.* 8*d.* per ℔., with good reports as to quality. The fineness of St. Kitts cotton seems to be a special feature of the reports and perhaps accounts for the ready sale.

NEVIS.

An account of the cotton industry in Nevis will be found in the Report of the Agricultural Instructor, and it will be seen from that how unfavourable the conditions, both as regards weather and insects have been during the past season.

The area under cultivation was increased by 500 acres chiefly owing to the efforts of the small growers in reclaiming bush land, but the weather was so unfavourable during the planting season that it was difficult to get a stand of cotton. Then when the plants were quite small they were attacked severely by caterpillars, which defoliated them almost before the poison could be applied. Later on, the local supplies of Paris green and lime gave out and much damage was done—in fact many of the fields of cotton were entirely destroyed and put into other cultivation.

Owing to this, the return per acre of lint has been very low, the total output of cotton for the season not exceeding 159,000 ℔. of lint, or about an average of 60 ℔. per acre for the island.

In order to prevent a recurrence of the failure of a supply of Paris green and lime, the local Government has stocked 1 ton of Paris green and the equivalent in lime to be kept at different centres in Nevis for sale to small growers, and, in cases of indigence, to be supplied without prepayment, an agreement being signed to pay when the cotton is reaped.

This industry is of such value to this small island, and to the small growers who are so largely engaged in it, that every reasonable assistance should be afforded them in this way by the Government for obtaining supplies of poison at reasonable rates, and so practically insuring their cotton against the attacks of caterpillars.

ANGUILLA.

An interesting report on the cotton industry in this small island has, as in previous years, been kindly supplied by Mr. Carter Rey, the chief cotton grower in the island and the owner of the Central Cotton Ginnery.

It is very encouraging to note that the cotton crop for the past season has been in advance of that of any previous year, the total amount of lint yielded, by Mr. Rey's report, being 132,034 ℔. The highest yield previously recorded was in 1911 when 127,495 ℔. was shipped. It is almost impossible to form a correct idea of the acreage under cultivation as the cotton is planted in all manner of places and conditions, but it is interesting to learn that the return of the area of 72 acres planted by Mr. Rey was 153 ℔. lint per acre. Judging from this, it would be safe to suppose that the average return of the whole island would be from 100 to 125 ℔. lint per acre, which to anyone who has witnessed the conditions under which cotton is grown in this small rocky island, speaks volumes for the industry of the peasant growers. The care that is taken by them in the picking and preparation of the seed-cotton is also worthy of emulation by cotton growers in more favourable situations.

As has been mentioned on previous occasions, there is no island perhaps in the West Indies where so much actual good has been effected by the introduction of this industry. Before cotton was planted, the value of the exports was

nil and the island practically lived on the charity of St. Kitts. Now we have a flourishing industry with exports to the value of over £10,000 giving employment to a large number of women and children, and bringing a definite degree of prosperity to all the small growers engaged in its production.

In this connexion, mention must be made of the valuable assistance afforded by Mr. Carter Rey in fostering this industry, as by loans received by him from the British Cotton Growing Association, and the local Government, he is able to make advances to the small growers during the planting time, to enable them to live until the cotton is reaped and sold.

When the cotton is picked by these small growers it is purchased from them by Mr. Rey at a definite price, paid on account, deducting from the amount any monies that may have been advanced. After the cotton is all sold, the average price is taken from the invoices, the exact value of the lint per lb. worked out, and if the value of the seed-cotton exceeds the amount advanced by Mr. Rey, a bonus is declared. During the season of 1911-12, the first payment was at 6c. per lb. of seed-cotton, and the bonus amounted to 1·68 c., which gave the small grower a total of 7·68 c. per lb. for his seed-cotton. This, in my opinion, would be as fair a price as was paid for seed-cotton any where in the West Indies. Mr. Rey's report is as follows :—

COTTON INDUSTRY AT ANGUILLA FOR SEASON, 1912-13.

The rainfall for the season was, July (1912) 1·17, August 1·62, September 2·39, October 7·59, November 4·51, December 2·18, January (1913) 2·87, February 1·62, March 2·15, April 2·94, May 3·03, June 1·65 ; total 33·72 inches.

This is a very good average rainfall, and with the exception of August it was a good growing season right through.

Cotton planting began generally about the second week in July, but a good lot had been planted in some districts in bush land as early as March and April. This did very well, and by the end of December 1912 quite a lot of cotton had already been ginned.

Insect pests were again very destructive ; considerable damage was done by black bugs early in the season, while the cotton worm was present in large numbers from the second week in November to the end of January. In dealing with the black bugs at the central factory it was found best to hand-pick them off the fields.

The entire area planted in cotton is not known : 72 acres were planted at the central cotton factory and the yield from this averaged 153 lb. of lint per acre, and the total crop for the island and Keys amounted to 132,034 lb. of lint.

The figures are as follows :—

Ginned and baled at Central Cotton Factory, 510 bales ...	119,148 lb.
Seed-cotton shipped 216,400 lb. @ 26 per cent.	56,264 ,,
	175,412 lb.
Less seed-cotton exported 166,842 lb.	43,278 ,,
Total crop	132,034 lb.

The cotton ginned at the central cotton factory yielded an average of 26·6 per cent. of lint, which is better than in any previous year.

(Sgd.) C. REY.

CROP RETURNS AND EXPORTS OF COTTON.

At the time of writing this report the ginning in the Presidency for this season is practically completed, and the return of cotton lint shipped from each island up to June 30 has been as follows :—

St. Kitts	...	...	302,664 lb. lint.
Nevis ..	...	...	158,976 „ „
Anguilla	...	...	112,138 „ „

The following table gives the returns in pounds of the exports of lint-cotton from the Presidency for the years 1904-12 :—

Island.	Year 1904.	Year 1905.	Year 1906.	Year 1907.	Year 1908.	Year 1909.	Year 1910.	Year 1911.
St. Kitts	24,107	87,070	121,762	269,109	205,682	230,940	241,717	348,908
Nevis ...	28,449	144,721	132,044	136,670	177,427	116,998	113,722	306,590
Anguilla	1,661	31,997	81,650	59,666	76,200	56,120	36,600	127,495
Total ...	54,217	263,788	326,456	465,445	459,309	404,058	392,039	782,993

Year 1912.

St. Kitts ...	359,222	lb. lint.
Nevis ...	207,262	„ „
Anguilla ...	97,142	„ „
Total ...	663,726	lb. lint.

PROGRESS IN MINOR INDUSTRIES.

Very little progress can be reported in the development of minor industries beyond what is stated earlier in this report under the heads Onions and Cacao. Rubber and limes have practically no value commercially, as the cultivation is so limited and there is no inclination to increase the area planted.

An attempt is being made to introduce the culture of silk worms in view of the paper read by Mr. Maxwell Lefroy on that subject before the West India Committee, and seeds of the Mulberry tree (*Morus alba*) were introduced through the Imperial Department of Agriculture to raise a supply of leaves for feeding the worm.

A small number of these trees have been raised and at the time of writing a few eggs of the silk worm have been received but none have hatched so far.

GENERAL AGRICULTURAL PROGRESS.

There have been no important changes or improvements in connexion with agriculture during the past year. The St. Kitts (Basseterre) Central Factory, full particulars of the erection of which were given in the Annual Report of 1911-12, has now successfully completed two years' work, the results of which have been most satisfactory.

The following table gives the results of the two years' working showing the quantity of cane crushed and amount of sugar made:—

Year.	No. of tons canes crushed.	No. of tons sugar manufactured.	Tons of cane per ton sugar.
1912	37,500	3,891	9·63
1913	54,338	6,226	8·73

In spite of the unfavourable weather conditions of the early part of the season, the average return of cane produced by the estates supplying cane to the factory was 18 tons per acre.

INSTRUCTION IN AGRICULTURAL MATTERS.

A report on the working of the agricultural side of the Grammar School has been prepared by the Head Master, Mr. W. H. Mitchell, M.A., and is included in this report. Mr. J. A. Rowbotham was appointed Science Master early in 1913 in the place of Mr. W. R. Dunlop, who resigned at the end of 1912.

The cadet N. J. L. Margetson, who was appointed from the agricultural side of the Grammar side in April 1912, served until October when he left to take up an appointment at the St. Kitts (Basseterre) Factory.

There being no other lads at the Grammar School suitable for entering the Botanic Station as cadets the vacancies have not yet been filled. This system has done good work in the past and it is to be regretted that it is not always possible to fill up vacancies owing to the small number of agricultural pupils at the school. The first cadet that was entered from the school, W. I. Howell, is now Agricultural Instructor in Nevis, and the cadet N. Margetson, who left for the factory in October was appointed as Foreman of the Botanic Station on probation for six months in February 1913.

Agricultural education in the Elementary Schools appears to make little advance and only a few schools have school gardens. Some little interest has been taken in this matter by these, and tools have been supplied them by the Inspector of Schools.

At the Agricultural Show held in February 1913, special prizes were as usual offered for school exhibits, but only two schools competed.

In the Reading Courses and Examinations for Practical Agriculture it is again a matter for regret that no candidates came forward for the courses or examinations. Owners and attorneys of estates do not seem to realize the importance of this system by which an overseer at no expense to himself, can pursue a course of study, and also pass an examination, that must be beneficial not only for the practical knowledge gained by him, but also to the estate on which he is employed.

EXTENSION OF INTEREST IN AGRICULTURAL PRODUCTS.

An Agricultural and Industrial Show, the seventh of its kind, was held on March 7, 1913, at the Grammar School, St. Kitts, under the auspices of the Imperial Department of Agriculture and the Agricultural and Commercial Society.

The Show was formally opened by His Honour the Administrator who regretted the absence of His Excellency the Governor, and the Imperial Commissioner of Agriculture.

The number of exhibits was 811 as against 736 in 1912. The indoor section was superior to that of previous years, the show of sugar-cane, and vegetables being particularly fine.

The twelve cut canes for which the first prize was awarded weighed 140 lb., and the three cabbages that took first prize weighed $32\frac{1}{2}$ lb., one weighing $12\frac{1}{2}$.

The miscellaneous exhibits included a show of seed-cotton and lint. In both of these classes fine specimens were to be seen, as also a very creditable exhibit of cotton seed cake, meal and oil, sent from Spooners Factory.

The show of stock was disappointing in number, and in no class was competition very keen. Several fine specimens of two-year-old colts were exhibited. The driving and riding competitions were vigorously contested and as usual were an attractive feature of the day's proceedings.

In addition to the prizes offered, twelve Diplomas of Merit awarded by the Imperial Department of Agriculture for articles of exceptional merit were distributed by His Honour the Administrator at a special meeting of the Agricultural and Commercial Society.

The exhibits to which these Diplomas were awarded comprised: native colt, native mules, team of steers, pair native fowls, 12 cut canes, vacuum pan sugar, vegetables, exhibit of cotton and its products, and fancy work.

As usual, a special stall was arranged for the exhibit from the Botanic Station and La Guérlte, on which was shown specimens of the produce produced. An interesting exhibit was sent from the Laboratory in Antigua and comprised specimens of insect pests, fungoid diseases, distilled oils, etc.

The Agricultural Superintendent, as Honorary Secretary to the Agricultural and Commercial Society, is responsible, with the assistance of his staff, for the general arrangement and management of the show.

CANADIAN NATIONAL EXHIBITION.

An exhibit was collected by the Permanent Exhibition Committee, of which the Agricultural Superintendent is Honorary Secretary, and forwarded to care of Messrs. Pickford & Black for exhibition at the Canadian National Exhibition held at Toronto.

The number of exhibits sent was ninety-three and comprised sugars, molasses, rum, cotton and its products, meals and starches, and preserves. Bunches of coco-nuts, sugar-canes and palm branches were also forwarded for purposes of decoration.

IMPERIAL INSTITUTE.

A collection of exhibits, thirty-two in number, representing in some degree the produce and resources of St. Kitts, was forwarded to the Imperial Institute for the purpose of outside exhibitions, and to replace any defective material.

The exhibits comprised sugars, molasses, rum, cotton (lint and seed); cotton seed cake and meal; cotton seed oil, starches and meals; pigeon peas, pea nuts, cashew nuts, preserved tamarinds and lime juice.

Details of Administration.

EXPENDITURE, RECEIPTS, SALES OF PLANTS, ETC.

The expenditure for the year was as follows:—

From Imperial Grant-in-aid :

	£	s.	d.
Agricultural Instuctor, Nevis	90	0	0
Special Services from Imperial Funds	3	7	0
Total from Imperial Grant-in-aid	93	7	0

From Local Funds :

	£	s.	d.
Curator's salary and house allowance	230	0	0
Foreman's salary and house allowance	50	0	0
Horse allowance to Agricultural Superintendent ...	30	0	0
Personal allowance to Agricultural Instructor, Nevis ...	50	0	0
Upkeep Botanic Station	169	17	2
Sugar-cane, cotton, and other experiments	224	18	2
Agricultural Education	89	17	3
Agricultural and Science Master	154	8	9
Experiments in Nevis	53	9	5
Total from local funds	£1,052	10	9
Total expenditure	£1,145	17	9

The receipts were as follows :—

La Guérite economic plots, sale of cotton, etc.	£235	18	9
Botanic Station, sale of plants	24	4	7
Nevis Experiment Station, sale of produce	10	8	10
Total receipts	£270	12	2

STAFF CHANGES.

In consequence of ill health, Mr. P. A. Webster the Foreman of the Botanic Station was compelled to resign his post on December 31, 1912. Mr. Webster had served as an apprentice at the Station for two years and had been promoted to the Foreman's place on April 1, 1912. He always evinced great interest in his work, and his enforced retirement and its cause are much to be regretted.

Mr. N. J. L. Margetson who had been a cadet at the Station was appointed as Foreman on February 11, 1912, on six months' probation.

CORRESPONDENCE AND DISTRIBUTION OF INFORMATION ON AGRICULTURAL MATTERS.

Correspondence with the Imperial Commissioner and the Superintendent of Agriculture for the Leeward Islands has been regularly carried on in connexion with matters of agricultural interest.

Copies of the *West Indian Bulletin* and Reports on Sugar-Cane Experiments have been received from the Imperial Department of Agriculture and distributed to persons interested.

Visits have been paid by the Agricultural Superintendent to the estates carrying out experiments with sugar-cane and also inspecting the cotton on the different estates, giving advice on agricultural matters to those needing it.

The Agricultural Superintendent is also the Honorary Secretary of the Agricultural and Commercial Society, which affords opportunities of distributing useful information to planters and others.

PUBLICATIONS RECEIVED.

In addition to the publications of the Imperial Department of Agriculture, including the Reports of the Botanic Stations in the different islands, the following were regularly received and are here gratefully acknowledged :—

The *Kew Bulletin*, *Bulletin of the Department of Agriculture*, Jamaica ; *Journal of the Jamaica Agricultural Society*, *Bulletin of the Department of Agriculture*, Trinidad ; Local Department of Agriculture, Barbados, Seedling Canes and Manurial Experiments ; the *Philippine Agricultural Review*, the *Agricultural Bulletin of the Federated Malay States*, the *Cuba Magazine*, *Experiment Station Record* of the United States Department of Agriculture, Reports on Experimental Farms, Canada ; the *Louisiana Planter*, and the *Porto Rico Experiment Station Annual Report.*

OFFICIAL VISITS.

Hon. Dr. Francis Watts, C. M. G., Imperial Commissioner of Agriculture, visited the Presidency from August 2 to August 10, 1912. He visited and inspected the Botanic and Experiment Stations in St. Kitts and Nevis, addressed a meeting of the St. Kitts Agricultural and Commercial Society on matters connected with the sugar-cane and cotton industries, and visited many estates in both islands.

Mr. H. A. Tempany, B. Sc., visited St. Kitts on November 15, 1912. He visited and inspected the Botanic and Experiment Stations.

Mr. H. A. Ballou, M.Sc., Entomologist to the Imperial Department of Agriculture, paid an official visit to the Presidency from the end of April to the middle of August 1912. He devoted much time and attention to the special investigation of insect pests attacking sugar-cane and cotton. A valuable report on this visit was forwarded through the Administrator for the information of members of the Agricultural and Commercial Society.

Mr. F. A. South, B.A., Mycologist to the Imperial Department of Agriculture, paid a special visit in June 1912 to investigate an outbreak of rind fungus on the sugar-cane in one district of the island. A report of this visit was also forwarded through the Administrator.

The Agricultural Superintendent, in connexion with his official duties, paid eleven visits to Nevis during the year, inspecting the Experiment Station, visiting the sugar-cane and cotton cultivations, and supervising the work of the Agricultural Instructor.

MISCELLANEOUS.

The Agricultural Superintendent in company of the Administrator paid an official visit to Anguilla and was absent from St. Kitts for five days, in February 1913. His time was fully taken up in visiting the cotton cultivation in this interesting island, inspecting the Central Ginnery belonging to Mr. C. Rey, and advising on planting trial plots of coco-nuts. A full report of this visit was forwarded through the Administrator for the information of His Excellency the Governor and the Commissioner of Agriculture.

The number of visitors who recorded their names in the visitors' book at the Botanic Station was 100. These were chiefly passing tourists, or strangers visiting the island.

METEOROLOGICAL RETURNS.

Rainfall.

The total rainfall for the year under review was 51·32 inches, which is 14·78 inches above that of 1911-12 for the same period. This excess is due to the heavy rainfall of the first three months of 1913 when 13·67 inches was registered, as against 5·24 inches for the corresponding period in 1912.

The rainfall for the twelve months ending December 31, 1912, was only 42·89 inches, which is about the average rainfall for the past ten years.

The following table gives the rainfall for the period under review ; the rainfall for the past eleven years is also attached :—

Month.	Rainfall in inches.	Number of days on which rain fell.	Maximum fall on any one day.
1912.			
April	3·01	9	0·61 (2nd)
May	1·06	10	0 26 (16th)
June	2·86	11	0·60 (24th)
July	2·59	14	0·60 (16th)
August	2·19	11	0·88 (5th)
September	7·61	14	2·15 (8th)
October	7·13	10	4·14 (7th)
November	8·80	15	2·10 (14th)
December	2·40	14	0·32 (29th)
1913.			
January	6·67	19	0·84 (27th)
February	4·06	13	1·65 (22nd)
March	2·94	20	0·76 (23rd)
Total ...	51·23	160	

Rain fell on 160 days in the year. The maxium rainfall on any one day was 4·44 inches, on October 7, 1912.

The rainfall at the Botanic Station for the last eleven years (1902-12) has been :—

Month.	1902. Inches.	1903. Inches.	1904. Inches.	1905. Inches.	1906. Inches.	1907. Inches.	1908. Inches.	1909. Inches.	1910. Inches.	1911. Inches.	1912. Inches.
January	...	0·92	3·51	2·13	2·25	1·45	1·29	7·31	2·44	4·98	2·69
February	...	1·30	2·00	2·41	1·61	1·99	1·81	2·85	1·27	4·51	1·40
March	...	1·83	2·03	1·43	2·57	0·67	5·50	1·92	1·71	2·30	1·15
April	3·90	2·08	1·94	2·41	3·79	0·97	0·75	1·12	1·83	·36	3·01
May	11·75	1·12	2·03	1·45	3·35	4·63	2·05	1·23	0·90	4·37	1·06
June	4·76	2·43	2·19	5·20	9·39	2 80	2·86	5·62	3·45	2·25	2·86
July	4·59	2·23	3·89	3·40	1·86	2·57	3·39	4·46	1·64	3·34	2·59
August	1·34	4·23	6·95	3·23	0·58	2·15	6·44	8·43	4·47	2·18	2·19
September ...	4·22	4·22	8·38	5·03	18·36	2·42	3·98	1·99	8·51	3·49	7·61
October	2·80	7·46	3·75	3·64	2·50	10·77	4·33	3·01	3·74	4·92	7·13
November ...	7·36	3·78	2·25	3·75	3·51	1·86	7·99	6·92	4·20	3·02	8·80
December	4·66	4·45	2·32	2·11	5·94	4·13	4·23	4·71	4·51	6·37	2·40
Total	45·38	36·05	41·24	36·19	55·71	36·41	44·62	49·57	38·67	43·09	42·89

Average rainfall for the past eleven years, 43·7 inches.

Temperature.

Readings on the maximum and minimum thermometers and the wet and dry bulbs are taken daily at 9 a.m and 3 p.m.

The mean monthly temperature during 1912-13 was 79·3° F. The maximum reading was 89° F. registered on September 30, and October 2 and 25., 1912. The minimum was 67° F. registered on January 19, 1913.

(Sgd.) F. R. SHEPHERD,

Agricultural Superintendent.

AGRICULTURAL EDUCATION AT THE GRAMMAR SCHOOL, ST. KITTS.

REPORT FOR THE YEAR 1912-13.

The vote for the year 1912-13 from local revenue was continued at £90, the same amount as was formerly granted from Imperial funds. There was also a grant of £5 7*s*. 4*d*. from unexpended balance of the Imperial Department.

The sum of £80 was expended in Agricultural Scholarships; £9 19*s*. 9*d*. was spent in equipment and repairs. Some structural alterations have been required at the school laboratory for which the grant from Imperial funds has been used, and the balance is to be utilized for the general upkeep of the laboratory.

The number of agricultural scholars during the year was ten. Two scholars left school in December and their places were filled as usual by competitive examination in January.

In December, Mr. W. R. Dunlop having completed nearly three years' service as Agricultural and Science Master resigned his post, and Mr. J. A. Rowbotham, arrived in February to assume the duties pertaining to the vacated position.

As in former years, the Science and Agricultural work of the school has been carried out on the lines laid down by the Syndicate of Local Examinations of the University of Cambridge.

It is regrettable that the Report of the Syndicate on the examination held in December falls far below the average of past years, as far as the work in natural sciences is concerned.

In Agricultural Science there was one candidate, who failed. In Chemistry, five were successful out of eleven candidates. In Botany, two candidates were successful out of six.

(Sgd.) W. H. MITCHELL.

Head Master.

Report of the Agricultural Instructor, Nevis, for the Year ending March 31, 1913.

WORK IN THE NURSERY AND DISTRIBUTION OF PLANTS.

Condition of Garden, Nursery, Etc.

The condition of the garden continues to be satisfactory. The ornamental border leading from the northern gate has been kept in good order, and some of the older crotons and panax have been removed and roses planted in their place.

The edging of Bread-and-cheese (*Pithecolobium Unguis-cati*) planted during 1910-11 has been kept trimmed to form a low border about 12 inches high and 6 inches wide.

Efforts are being made to establish a small nursery of ornamental plants and shade trees, and the small stock of plants now on hand is doing fairly well. The total number of plants distributed from the station, including 300 Bread-and-cheese seedlings, was 374.

Plant Importations.

The importation of plants during the year was not very great, and consisted chiefly of plants and seeds received from the Imperial Commissioner of Agriculture, and from the Curator of the Botanic Station, St. Kitts. Among those received. the following may be mentioned: *Combretum laxum*, *Solanum robustum*, Mulberry, *Elaeis guincensis*, and *Cassia grandis*.

PLOT EXPERIMENTS AT THE EXPERIMENT STATION.

Various economic and food-producing crops were planted in the plots during the year.

Experiments with the following crops were carried out:—

Sweet potatoes	Indian corn
Hybrid cotton	Black eyes
Pea nuts	Mazzagua Guinea corn
Onions	Yams
Lima beans	Cassava.

Plot A.

Five varieties of sweet potatoes were planted in this plot on April 30. The cuttings were planted 2 feet apart in rows 3 feet wide. The crop suffered much from drought and the returns were very poor.

After the potatoes were taken out, the plot was manured and planted in two varieties of Indian corn viz. a Trinidad variety, and the best local variety, in alternate rows. The young plants made a fairly good stand but suffered much from want of rain. Some good ears were however obtained, the best of which were selected for planting and a small supply of the seeds distributed to planters and school gardens in the island.

Plot B.

This plot was carefully prepared and planted with seeds from the best hybrid cotton grown at the Experiment Station last year. The seeds were planted on August 21, 1912, in rows 4 feet apart and 3 feet apart in the rows. The plants all grew vigorous and healthy, and were remarkably uniform in type. They were all prolific bearers, some producing as many as 120 bolls. The total weight of seed-cotton reaped from this plot was 90 lb., which is equal to 900 lb. of seed-cotton to the acre.

Mr. H. F. Wildy, the manager of the Cotton Factory, Charlestown, kindly undertook to ship a sample of the lint to the Fine Spinners to be reported on.

Plot C.

Black eye peas were planted in this plot as a green dressing, early in April. The green dressing was turned under in July and Indian corn planted in August. The corn grew fairly well for a time but was afterwards killed by the drought.

The plot was again prepared and planted in five varieties of sweet potatoes on October 10, 1912.

The returns are as follows:—

Variety.	Yield per plot of 3 rows in lb.	Calculated yield per acre in lb.
Harris	320 ...	... 17,066
Caroline Lee	313 ...	... 16,693
Mother Kitty	310 ...	... 15,733
Brass Cannon	240 ...	... 12,800
Six Weeks	232 (4 rows)	... 9,300

Cuttings of the above varieties were distributed to growers in the island.

Plot D.

Two varieties of ground nuts were planted in this plot, the Spanish and the native. One fourth of the plot was planted in Spanish nuts and three-fourths in native.

Both varieties were sown, in furrows 12 inches by 12 inches apart, on June 25, 1912, and reaped on November 26, 1912.

The crop suffered very much from drought and the returns were very poor. The Spanish gave 20 lb. from one-fourth of the plot—equal to 800 lb. to the acre; and the native gave 36 lb. to three-fourths of the plot—equal to 480 lb. to the acre.

A small quantity of both the above varieties was distributed to growers and the schools, and the remainder kept for planting next season.

Plot E.

Mazzagua Guinea corn was planted in this plot on June 21. The plants grew fairly well but suffered very much from drought, and only 59 lb. of seeds were obtained from the plot.

The ears from this variety are much larger than those of the local variety, and the stem is somewhat taller and thinner.

A supply of the seeds has been kept for planting next season, and the remainder distributed to growers in the island where the plant is used chiefly as a wind-break for cotton; but on account of its slender stem it is not so well suited for this purpose.

Plot F.

Woolly pyrol and Jerusalem peas were planted in this plot as a green dressing. The woolly pyrol did fairly well but the Jerusalem pea was a failure.

The green dressing was turned under in August, and the plot afterwards laid out in beds, 6 feet wide, early in October 1912.

The onion seeds received from Teneriffe were sown in nursery beds and the young plants set out in the beds, 6 inches by 4 inches apart, on October 28, 1912.

The crop was harvested in March 1913 and a return of 1,200 lb. of onions was reaped from the plot, which is $\frac{1}{10}$-acre in size. The onions were all sold in the local market and realized £6 17s. 3d.

Plot G.

Eight varieties of yams were planted in this plot. The cuttings were treated with Bordeaux mixture and afterwards planted on 4-foot banks at a distance of 2 feet apart.

The crop suffered very much from drought and only enough yams for planting next season were obtained. The yam crop throughout the island was far below the average this season.

Plot H.

This plot was previously in Guinea corn. The corn stalks were turned under and three varieties of cassava planted on June 17, on banks 4 feet apart, and 3 feet apart on the banks. The cuttings germinated, but owing to the want of rain the return was very low.

The returns are as follows :—

	Yield per plot in lb.	Yield per acre in lb.
Santerley (6 rows) ...	233	874
Braziers	107	340
Black Stick	96	300

Hedges.

The hedges enclosing the Experiment Station are all now fairly well established. They are kept well trimmed and in good order, and are indeed very ornamental.

Cotton Demonstration Plot.

The 2 acres of land to the north of the experimental plot were again used this year as a cotton demonstration plot. The banks, which were 5 feet apart, were changed to 4 feet, and the drains re-opened.

The plot was divided into two equal parts. In the one half La Guérite selected seed (No. 205) was planted on June 5, 1912, and in the other half local seed was planted on July 5. The seeds germinated well, but owing to want of rain very many of the plants died, and the field had to be practically replanted with the same seed as before, towards the end of July. The weather was more favourable and the plants grew fairly well. The plot was attacked by cotton worm (*Alabama argillacea*) in October and again in November, but the worms were kept in check by the use of Paris green

During the month of November the rains were fairly heavy and continuous, which caused boll-dropping to a fairly great extent.

The total weight of seed-cotton reaped from the plot is 1,200 lb.—690 lb. from the plot in which La Guérite seed was planted, and 510 lb. from that in which local seed was planted. A bale of 260 lb. of lint was shipped to the British Cotton Growing Association and sold at 18½*d.* per lb. The seed from the above was selected and sold to peasants at 1*d.* per lb.

Some of the best trees grown in the plot were selected to start work in seed selection.

The hedges around the plot, which are of great use in keeping out stock that are sometimes pastured on the adjoining land, have been kept trimmed and in good order.

Cotton Selection Work.

Work in seed selection was carried out on the demonstration plot on the line laid down in the *West Indian Bulletin*, Vol. VII, p. 153.

In the field, twelve trees of the desirable type were selected—six from the plot in which La Guérite seed was planted and six from the plot in which local seed was planted. The trees were all carefully labelled and the seed-cotton from each tree picked and kept in separate bags, each bag bearing the number corresponding to that of the tree from which the cotton had been picked. The lint from the selected trees was carefully examined, and of the twelve trees selected in the field, seven were chosen in the final test, which is chiefly for the quality of the lint.

The table given below shows the results obtained :—

TABLE I.

Plant No.	Height of plant.	No. of bolls on plant.	Max. no. of bolls per branch.	Weight of seed-cotton to plant, oz.	Strength of fibre.	Length of fibre, in mm.	Regularity of length.	Lustre.	Fineness.
100 L. G.	4 ft.	80	7	4	Strong	48·0	Regular	Lustrous	Fine
102 L. G.	4½ ft.	110	8	6·5	Very strong	48·4	Regular	Lustrous	Fine
103 L. G.	4⅛ ft.	100	7	5·5	Strong	49·2	Regular	Fairly lustrous	Fine
104 L. G.	3½ ft.	95	7	4·0	Strong	50·5	Very regular	Lustrous	Fine
107 Local	4½ ft.	88	8	3·25	Fairly strong	48·5	Fairly regular	Very lustrous	Very fine
109 Local	4½ ft.	75	10	2·25	Very strong	45·9	Very regular	Lustrous	Fine
111 Local	3½ ft.	60	9	5·5	Strong	48·9	Regular	Lustrous	Fine

Three seeds with longest fibre of each of the above plants are kept for planting a nursery plot next season. In selecting these seeds great care was taken to select them from locks which were entirely free from 'nep'.

Hybrid Cotton.

Experiments with the hybrid cotton received from Mr. Bovell were continued during the year. Of the eight trees selected last year the lint from one plant only (No. 1), was considered worthy of further trial. The samples were not obtained from bagged bolls and the cotton from some of the plants was very short and harsh. No. 1, the one selected, was fairly uniform and the lint of a fair length and quality. A small quantity of seed-cotton from this sample was hand-picked and the seeds planted in plot B. The plants all grew strong and healthy and were remarkably uniform in type. The trees were all prolific bearers, some producing as many as 120 well-shaped bolls. The plot was gone over carefully and two of the most prolific trees selected from which to obtain seeds to carry on the experiment next season.

The following is a short account of one of the selected plants: height 5 feet, habit fair, number of bolls 110, weight of seed-cotton 7 oz., length of fibre 49·1 mm. strength fairly strong, and fine.

From the above it is seen that this cotton possesses qualities which should warrant its trial on a larger scale, but owing to want of space, the experiment has to be confined to the plot of $\frac{1}{10}$-acre in size. The total amount of seed-cotton reaped from the plot is 90 lb. —900 lb. of seed-cotton to the acre.

WORK IN CONNEXION WITH INSECT AND FUNGUS PESTS AND THEIR CONTROL.

Specimens of diseased plants were sent to the Head Office from time to time for examination. These were reported on and suggestions given as to means of control.

A parasite was observed attacking the cotton worm during November 1912. Specimens were sent to the Head Office where it was identified as a species of Chalcis. The parasite was found in nearly all the cotton fields in the island, and in some about 75 per cent. of the pupae were parasitized.

In accordance with the provisions of the Plant Protection Ordinance thirty consignments of plants and seeds were received at the Experiment Station for fumigation or disinfection: these include 1,300 lb. of Sea Island cotton seed imported from Barbados and 500 coco-nuts from Dominica.

Progress in the Chief Industries.

THE SUGAR INDUSTRY.

Experiments with fifteen varieties of sugar-cane were carried out at Round Hill and at Cane Garden estates in connexion with the work of the Imperial Department of Agriculture. The canes were weighed in the field under the supervision of the Agricultural Instructor, and a sample of 100 lb. was taken from each variety and sent to the Government Laboratory at La Guérite, St. Kitts. Some of the varieties did fairly well, but in consequence of the drought the results, on the whole, were poor. An account of these experiments is published in the Official Reports on the Sugar-cane Experiments in the Leeward Islands for the season 1912.

Owing to the drought, the sugar-cane crop for 1912-13, though a trifle better than last year's, was still very poor; the average return throughout the island was not more than $\frac{1}{2}$-ton of sugar to the acre.

The acreage under cultivation remained about the same as that of 1911-12.

COTTON.

There was an increase of about 500 acres planted in cotton in Nevis for 1912-13, making the total area under cotton 2,500 acres. This increase is made up chiefly by bush land, cleared by peasants, and pasture.

As usual, a supply of the best locally grown cotton seed was bought and selected at the Experiment Station and sold to small growers at cost price.

On account of the drought, the crop was not established until late in the season. During the months of October and November the crop was attacked by cotton worms. The attack in October was not very severe, and in most cases the worms were kept under by the use of Paris green. But in November the attack was extremely severe, and at this time the weather was very showery, which often washed off the poison within a short time after it had been applied, in consequence of which large quantities of poison had to be used and the supply of both Paris green and lime in the island was very soon exhausted. Great efforts were made to keep the worms in check, but on account of the unfavourable weather and the lack of a sufficient supply of poison the worms could not be controlled, and almost every field in the island was entirely defoliated.

A small supply of Paris green and lime was kept at the Experiment Station for sale to small growers, but this was very soon exhausted.

A small return of cotton was reaped from the more advanced fields, but very little or no cotton was reaped from the later fields as the new growth was badly attacked by leaf-blister mite.

The local Government has stocked a large supply of Paris green and lime for next season for the benefit of the smaller growers.

Mildew and boll-dropping occurred to a very great extent during the month of November ; as many as 30 per cent. of the bolls in some fields dropped.

Two new ginneries were erected during the year : one by Mr. J. O. Maloney at Fothergills estate, and the other by Mr. W. P. Maynard at Simons.

Progress in Minor Industries.

Coco-Nuts.

The coco-nut cultivation at Pinneys estate is all that could be desired. The area under cultivation is 210 acres. The older trees, which are about six years old, are bearing well, and as many as 150 nuts have been counted on some of the trees. Dry nuts are now being collected and there is a small demand for selected nuts for planting. Other small areas of coco-nuts exist in this island.

Onions.

Sixteen pounds of white and 14lb., of red Bermuda onion seeds were imported from Teneriffe through the Imperial Department of Agriculture and sold to growers at cost price.

The crop, on the whole, turned out well and the onions produced were all sold in the local market at remunerative prices. But owing to onions being imported from Bermuda and elsewhere, the industry cannot be carried on to any great extent.

Vanilla.

The vanilla at Maddens estate has given very encouraging results ; a fair crop of beans was reaped, some of which were sold at fairly good prices. The area now under cultivation is about 50 acres and the vines are all quite healthy and vigorous.

Extension of Interest in Agricultural Products.

An Agricultural and Industrial Show was held on February 27, 1913, at Stoney Grove pasture under the auspices of the Imperial Department of Agriculture and the Agricultural and Commercial Society of Nevis.

The Show was formally opened by His Honour the Administrator.

Special grants were given in aid of the prize fund: by the local Government £25, by the Imperial Department of Agriculture £18, and by Ellis Kislingbury & Co. £10. Special prizes were offered by His Honour the Administrator, the Hon. J. S. Hollings, Mrs. H. F. Wildy, H. F. Wildy, Esq., and S. W. Matthews, Esq.

The number of exhibits was about 500, all of which were of good quality. The live stock was a special feature. There was a splendid show of young horses and brood mares. Most of the young horses shown were sired by the Jamaica thoroughbred 'Forestor', once owned by Mr. H. C. Huggins, but now sold to St. Kitts.

The driving and riding competition was a new feature at shows in Nevis and added much to the interest.

The cattle were somewhat disappointing, especially in the classes of steers and cows; there were however some very fine bulls shown.

The vegetable classes were well represented and there were indeed very good exhibits of yams, sweet potatoes, pumpkins, and Indian corn.

Under the section Industries were very good exhibits of fancy work, turner's work, and native-made baskets.

In the section Miscellaneous Exhibits were shown very good samples of seed-cotton and cotton lint.

There was a special class for school exhibits, but only one school sent exhibits. These were of fairly good quality, especially the collection of vegetables which included very fine egg-fruits and pumpkins.

Six Diplomas of Merit were awarded by the Imperial Department of Agriculture for exhibits of exceptional quality. These were awarded as follows: H. F. Wildy, Esq., for best exhibit of cotton lint, J. H. Sampson, Esq, for best exhibit of seed cotton, P. Jeffers, Esq., for a piece of turner's work, J. A. Howell, Esq., for jewellery, J. Barret, Esq., for hide of tanned leather, and C. Clifton, Esq., for a model engine.

The exhibition was open to receive exhibits from St. Kitts but most of the exhibits shown were from this island.

Imperial Institute.

Samples of cotton lint and seed-cotton grown in the island were forwarded for permanent exhibition at the Imperial Institute.

Agricultural Education.

School gardening is carried out at five elementary schools in the island some of which are doing good work, but there is much room for general improvement.

Details of Administration.

STAFF CHANGES.

Mr. W. I. Howell was confirmed in the appointment as Agricultural Instructor after acting for six months.

ADDITIONS AND REPAIRS TO BUILDINGS.

No addition to the building was made during the year under review, but a slight repair was done to the verandah to the east of the office.

CORRESPONDENCE AND DISTRIBUTION OF INFORMATON ON AGRICULTURAL MATTERS.

Correspondence has been regularly carried on with the Commissioner of Agriculture and the Agricultural Superintendent at St. Kitts on matters of general agricultural interest of the island.

The publications of the Imperial Department of Agriculture and also the Annual Reports of the Botanic Stations have all been regularly received. Besides these, the following publications have also been received regularly and are herewith gratefully acknowledged : The *Journal of the Jamaica Agricultural Society*, the *Philippine Agricultural Review*, andthe *Experiment Station Record* of the United States Department of Agriculture.

DISTRIBUTION OF INFORMATION ON AGRICULTURAL MATTERS.

This forms a most important part of the work of the Agricultural Instructor and is carried on by means of regular fortnightly visits paid to each district in the island when advice on cultivation and care of their crops, is given to the small growers, and also to planters who may be willing to receive it. In this connexion cotton forms a special feature of the work, and an attempt was made to record the number of peasant growers with the acreage under cotton, so as to bring the Agricultural Instructor into closer touch with the small growers.

These regular visits also enable the Agricultural Instructor to detect any insect or other pests likely to damage the crops, and to offer advice on the spot as to the best methods of dealing with them.

Monthly reports are submitted giving any matters of interests that have occurred during the month, and quarterly reports, which deal more fully with the condition of the crops, etc. These are forwarded for the information of His Honour the Administrator, His Excellency the Governor, the Commissioner of Agriculture, and the Superintendent of Agriculture for the Leeward Islands.

The school gardens in the different districts are also regularly visited and advice offered with regard to the work in progress.

OFFICIAL VISITS.

Dr. F. Watts, C.M.G., Imperial Commissioner of Agriculture, visited the island on August 6, 1912. Dr. Watts remained in the island for two days, during which time he visited the Experiment Station, the coco-nuts at Pinneys estate and a few other estates in the island.

Mr. H. A. Ballou, M. Sc., Entomologist on the Staff of the Imperial Department of Agriculture, visited the island on June 6, 1912, Mr. Ballou visited the limes at the Farm estate, the coco-nuts at Pinneys estate and a few other estates.

Mr. F. R. Shepherd the Agricultural Superintendent, St. Kitts-Nevis, visited the island many times during the year and gave advice on agricultural matters in general. Mr Shepherd also visited the island in connexion with the holding of the Nevis Agricultural Show when he rendered most useful services. He also accompanied Dr. Watts and Mr. Ballou on their visits to the island.

METEOROLOGICAL RETURNS.

Rainfall.

The total rainfall for the year was 45·52 inches, which is 4·42 inches more than that of last year.

Rain fell on 140 days during the year, and the heaviest fall recorded for any one day was 235, which occurred on October 7, 1912.

The tables attached show the rainfall at the Experiment Station for the year and that for the past seven years.

Month.	Rainfall in inches.	No. of days on which rain fell.	Maximum fall on any one day.
1912.			
April	4·20	9	·74 (16th)
May	·79	5	·40 (20th)
June	2·51	12	·80 (2nd)
July	3·56	11	2·09 (16th)
August	3·46	8	1·02 (5th)
September	3·19	15	·50 (8th)
October	5·25	9	2·35 (7th)
November	6·43	19	·94 (8th)
December	2·85	15	·42 (12th)
1913.			
January	7·18	21	·96 (27th)
February	1·96	5	·66 (15th)
March	4·14	13	·54 (12th)
Total	45·52	140	

RAINFALL AT THE EXPERIMENT STATION, NEVIS, FOR THE PAST SEVEN YEARS, 1906-12.

Months.	1906 inches.	1907 inches.	1908 inches.	1909 inches.	1910 inches.	1911 inches.	1912 inches.
January	3·28	3·22	2·58	3·86	5·24	6·38	3·84
February	2·22	2·32	1·70	3·46	2·82	2·78	·68
March	1·71	1·23	7·16	·96	1·33	2·32	2·66
April	2·49	1·08	2·18	2·72	·44	4·02	4·20
May	3·94	3·30	4·24	1·62	1·08	4·08	·79
June	7·30	4·12	2·83	9·52	4·24	·92	2·51
July	4·11	4·86	3·34	4·52	2·80	2·72	3·56
August	2·94	2·64	5·02	8·71	7·10	2·34	3·46
September... ...	18·93	3·76	6·98	3·46	7·00	5·30	3·19
October	3·10	6·92	1·44	7·38	1·86	3·58	5·25
November	3·42	2·54	6·93	2·44	3·32	2·80	6·43
December	6·67	7·46	6·10	2·74	4·68	8·84	2·85
Total	60·11	43·45	50·50	50·69	41·91	46·08	39·42

TEMPERATURE.

Readings on the maximum and minimum thermometers and the wet and dry bulbs are taken daily at 9 a.m., and at 3 p.m.

The mean, monthly temperature during 1912-13 was 82·0. The maximum reading was 89° F. registered on September 28, 1912, and the minimum 64° F., February 6, 1913.

M. I. HOWELL,

Agricultural Instructor.

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